EASE Browser - [Tagged | US 5801696 | Tag: S_T5 | Doc: 25/28 (SORTED) | "Full" 10/15 (Total images 15)]
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Tagged | US 5801696 | Tag: S_T5 | Doc: 25/28 (SORTED) | "Full" 10/15 (Total images 15)

pointing device in order to establish which queue in the first set should receive that event.

An enhancement used in preferred embodiments of the present invention involves the use of logical events rather than actual events. With this approach, the events stored by the routing means in the first and second sets of queues are logical events rather than the actual events entered via the specific input devices. The incorporation in the preferred embodiment of logical events allows devices to be changed without specific changes to applications. Any new device is classified as either 'keyboard-like' or 'pointer-like' and the events handled accordingly.

From the above, it is apparent that the present invention uses a hybrid queue to handle user events in a GUI system. The problems of system lockup, extra user effort, and the inability to provide a 'type ahead' facility, are avoided. Input devices are divided into two categories: keyboard-like (or non-pointing) devices where the input contains no positional information; and pointing devices, such as a mouse or stylus, that have positional information attached to each event. For input from pointing devices, a queue is built for each window on the system. For input from keyboard-like devices, the system according to the invention simulates a single queue for each type of keyboard-like device, these queues being transferrable between the various windows of the GUI system. This approach provides a system with type ahead capabilities, whilst the presence of multiple queues prevents lock up by a badly written application.

The present invention will be described further, by way of example only, with reference to a preferred embodiment thereof as illustrated in the accompanying drawings, in which:

FIG. 1 illustrates how events are handled in a synchronous event handling system according to the prior art;

FIG. 2 illustrates how events are handled in an asynchronous event handling system according to the prior art;

FIG. 3 illustrates how events are handled in a system according to the preferred embodiment of the present invention;

FIG. 4 is a block diagram illustrating a system according to the prefered embodiment of the present invention;

FIGS. 5A and 5B are flow diagrams illustrating how events are received and handled by the dispatcher of the system according to the preferred embodiment; and

FIG. 6 is a flow diagram illustrating how an application processes events stored on the various queues by the system of the prefered embodiment.

Before discussing the preferred embodiment of the present invention in detail, the following overview of a system according to the prefered embodiment will be given. In the following description a 'keyboard-like' device may be considered to be one that sends a stream of character input to the system. As well as actual keyboards other devices may behave like keyboards. For example, a speech recognition device may turn spoken words into sequences of keystrokes.

In the system of the prefered embodiment, a queue is initially assigned to each keyboard-like device connected to the system. For each keyboard-like device, the associated queue handles keystrokes in a FIFO manner. The output from each of these queues will be directed to one particular window at any specified moment in time, but such queues are transferable between the various windows. As with many current systems the window which is receiving input is said to have "focus". Hence, for example, at any moment in time only one window will have keyboard focus and so be able to receive typed input from the keyboard. At the same moment in time another window may have speech focus and so be able to receive spoken input.

In the preferred embodiment, to provide for events from pointing devices that, in contrast to keyboard-like devices, include positional information, a single FIFO queue is provided for each window on the system. The events from each pointing device (eg. a mouse, a stylus, etc) are directed to the queue associated with the window that is identified by the coordinates of the event.

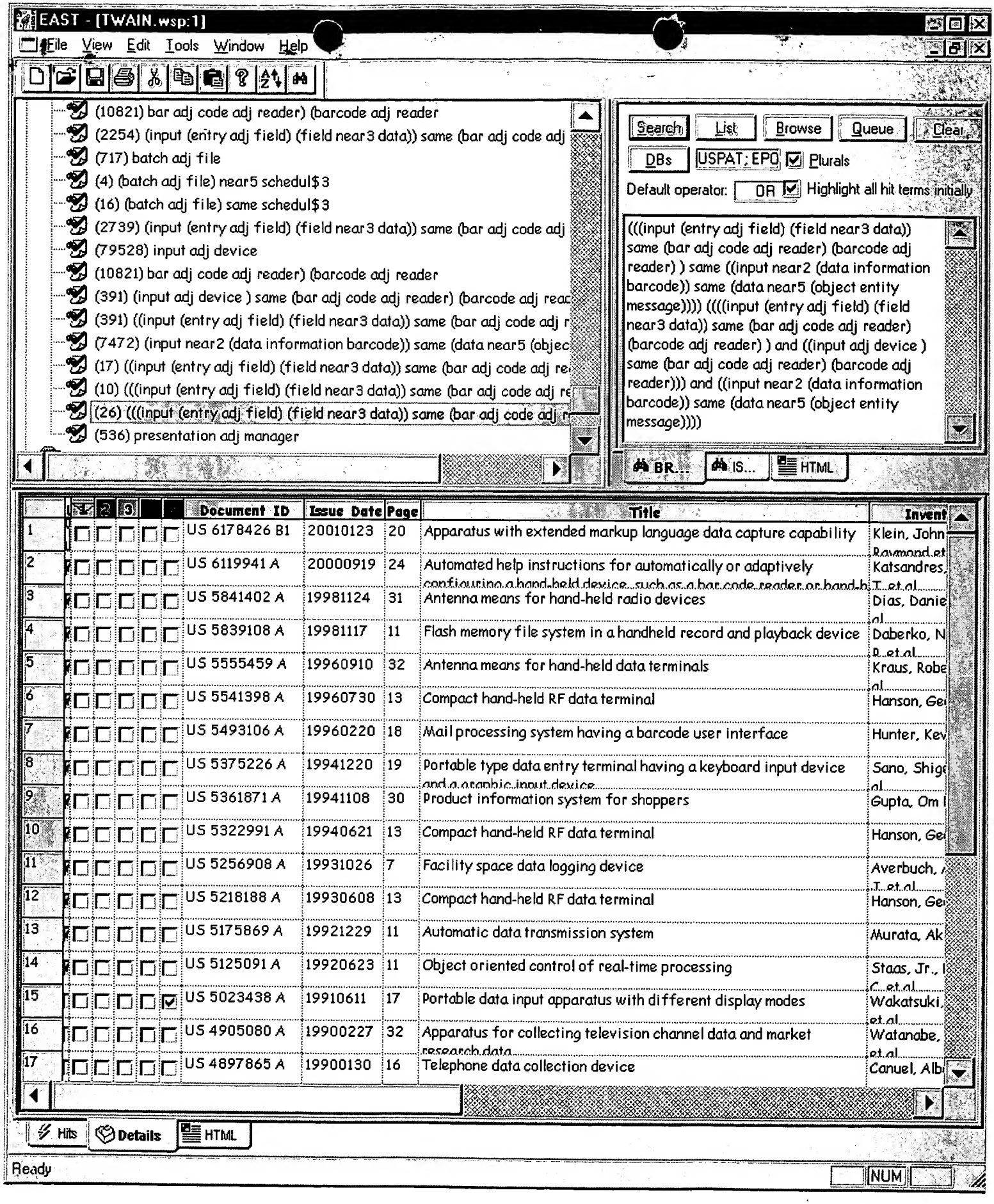
FIG. 3 illustrates the manner in which events are handled in a system according to the preferred embodiment of the invention. As in the prior art examples described with reference to FIGS. 1 and 2, Application A 10 has three windows 11, 12, 13 associated therewith and Application B 20 has one. As with the asynchronous case, every event (irrespective of the originating input device) is passed straight to a dispatcher 100, rather than being placed on a queue first. However the dispatcher 100 in this case decides whether the event has originated from a pointing device or a non-pointing device before deciding where to send the event for processing. If the event has originated from a pointing device, the positional information included in that event is used to determine which window the event was directed to, and the event is then sent to a queue that is established to receive events from pointing devices directed to that window. If on the other hand the event has come from a keyboard-like device, then the event is directed to the queue that is associated with that particular keyboard-like device. As mentioned before this queue can be transferred between the various windows as and when required; the manner in which this is done in the preferred embodiment will be discussed in more detail later.

In the FIG. 3 example, Application B is currently receiving input and the dispatcher 100 is directing input to queues 110 and 115 associated with that application. Queue 110 may, for example, be the queue permanently associated with Application B's window for the storage of events from pointing devices that are directed to that window, whilst queue 115 may be a queue for a keyboard device which is currently associated with Application B's window.

When a queue for a keyboard-like device is transferred, then in the preferred embodiment of the invention, the current queue is closed to prevent any further events from that keyboard-like device being added to it, and a new queue for that keyboard-like device is established. Depending on the situation, ownership of the closed queue may or may not be transferred to the window taking ownership of the new queue. The main thing is that, in any instance, there is only one open queue for any particular keyboard-like device, the dispatcher 100 having access to information identifying the location of such open queues.

With regards to the queues established for pointing devices, these queues are always associated with specific windows and are not transferred between windows. Hence it is not necessary to have only one such queue open at any one time (although in the preferred embodiment the system does only keep one queue open to receive input from pointing devices). Thus Application A and Application B could both simultaneously have queues open to receive input from the mouse, this being a pointing device. However they will not both simultaneously have queues open for the keyboard, since this is a non-pointing device and as such there is a single open queue associated with that device (unlike pointing devices where the open queue(s) is/are associated with specific windows rather than the device).

The closed queues can still be used by the applications with which they are associated, thereby allowing an application to process events directed to it by a particular device before the queue was closed (the queue being closed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(391) ((input (entry adj field) (field near3 data)) same (bar adj code adj r
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(10) (((input (entry adj field) (field near3 data)) same (bar adj code adj re
(26) (((input (entry adj field) (field near3 data)) same (bar adj code adj r
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List
Browse
Queue
Clear
DBs
USPAT; EPO
Plurals
Default operator:
OR
Highlight all hit terms initially
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Title
Invent
1 US 6178426 B1 20010123 20 Apparatus with extended markup language data capture capability Klein, John Raymond et
2 US 6119941 A 20000919 24 Automated help instructions for automatically or adaptively Katsandres, T. et al
3 US 5841402 A 19981124 31 Antenna means for hand-held radio devices Dias, Danie al
4 US 5839108 A 19981117 11 Flash memory file system in a handheld record and playback device Daberko, N D. et al
5 US 5555459 A 19960910 32 Antenna means for hand-held data terminals Kraus, Robe al
6 US 5541398 A 19960730 13 Compact hand-held RF data terminal Hanson, Ge
7 US 5493106 A 19960220 18 Mail processing system having a barcode user interface Hunter, Kev
8 US 5375226 A 19941220 19 Portable type data entry terminal having a keyboard input device Sano, Shig and a graphic input device al
9 US 5361871 A 19941108 30 Product information system for shoppers Gupta, Om
10 US 5322991 A 19940621 13 Compact hand-held RF data terminal Hanson, Ge
11 US 5256908 A 19931026 7 Facility space data logging device Averbuch, T. et al
12 US 5218188 A 19930608 13 Compact hand-held RF data terminal Hanson, Ge
13 US 5175869 A 19921229 11 Automatic data transmission system Murata, Ak
14 US 5125091 A 19920623 11 Object oriented control of real-time processing Staas, Jr., C. et al
15 US 5023438 A 19910611 17 Portable data input apparatus with different display modes Wakatsuki, et al
16 US 4905080 A 19900227 32 Apparatus for collecting television channel data and market research data Watanabe, et al
17 US 4897865 A 19900130 16 Telephone data collection device Canuel, Alb
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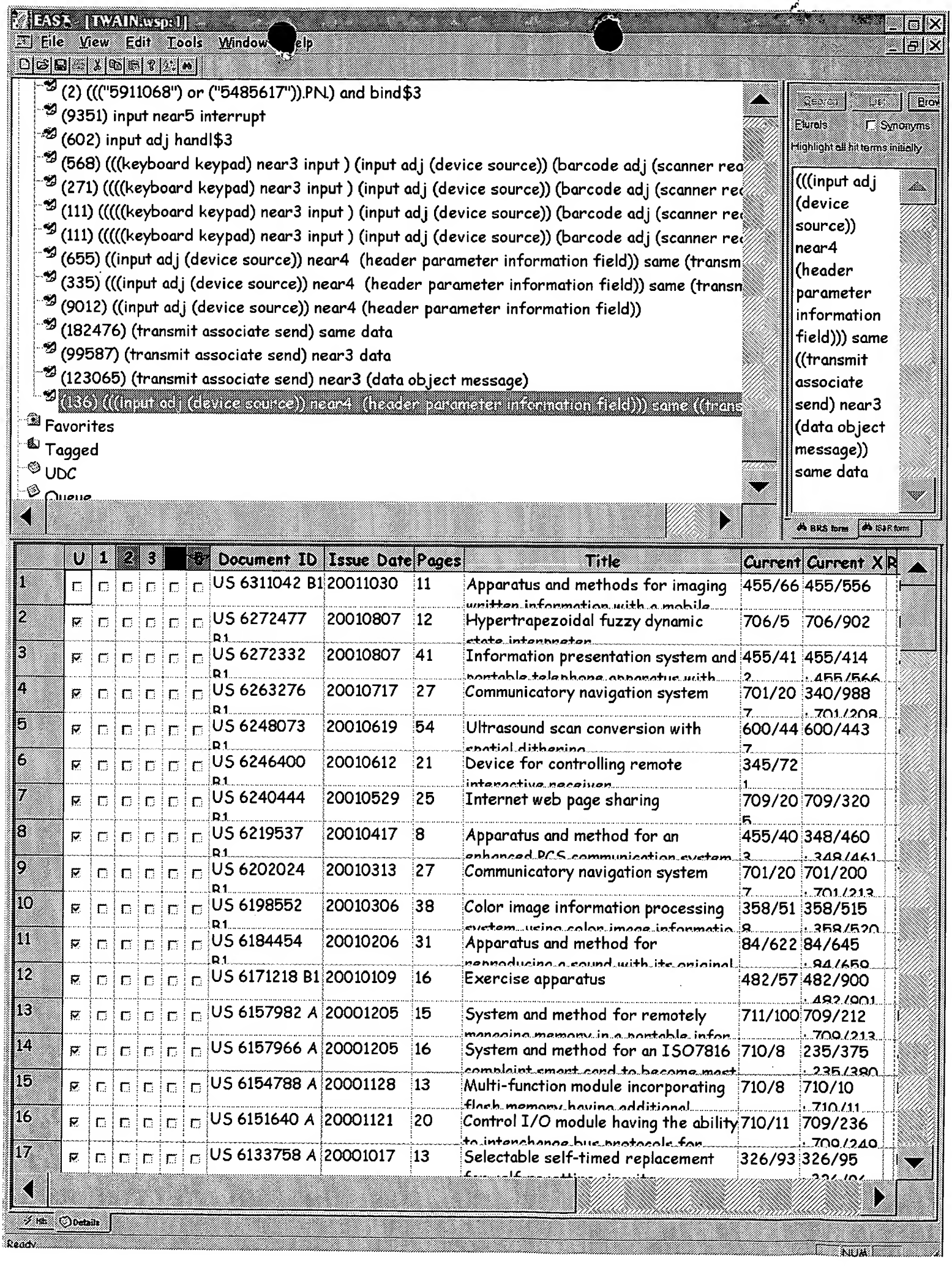
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(111) (((((keyboard keypad) near3 input) (input adj (device source)) (barcode adj (scanner re
(111) (((((keyboard keypad) near3 input) (input adj (device source)) (barcode adj (scanner re
(655) ((input adj (device source)) near4 (header parameter information field)) same (transm
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(99587) (transmit associate send) near3 data
(123065) (transmit associate send) near3 (data object message)
(136) (((input adj (device source)) near4 (header parameter information field))) same ((transmit
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Tagged
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Synonyms
Highlight all hit terms initially
(((input adj (device source)) near4 (header parameter information field))) same ((transmit associate send) near3 (data object message)) same data
BRS form
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U 1 2 3 Document ID Issue Date Pages Title Current Current X
1 US 6311042 B1 20011030 11 Apparatus and methods for imaging written information with a mobile 455/66 455/556
2 US 6272477 B1 20010807 12 Hypertrapezoidal fuzzy dynamic state interpreter 706/5 706/902
3 US 6272332 B1 20010807 41 Information presentation system and portable telephone apparatus with 455/41.2 455/414 ; 455/566
4 US 6263276 B1 20010717 27 Communicatory navigation system 701/207 340/988 ; 701/208
5 US 6248073 B1 20010619 54 Ultrasound scan conversion with spatial dithering 600/447 600/443
6 US 6246400 B1 20010612 21 Device for controlling remote interactive receiver 345/721
7 US 6240444 B1 20010529 25 Internet web page sharing 709/205 709/320
8 US 6219537 B1 20010417 8 Apparatus and method for an enhanced PCS communication system 455/403 348/460 ; 348/461
9 US 6202024 B1 20010313 27 Communicatory navigation system 701/207 701/200 ; 701/213
10 US 6198552 B1 20010306 38 Color image information processing system, using color image informatio 358/518 358/515 ; 358/520
11 US 6184454 B1 20010206 31 Apparatus and method for reproducing a sound with its original 84/622 84/645 ; 84/659
12 US 6171218 B1 20010109 16 Exercise apparatus 482/57 482/900 ; 482/901
13 US 6157982 A 20001205 15 System and method for remotely managing memory in a portable infor 711/100 709/212 ; 709/213
14 US 6157966 A 20001205 16 System and method for an ISO7816 complaint smart card to become mast 710/8 235/375 ; 235/380
15 US 6154788 A 20001128 13 Multi-function module incorporating flash memory having additional 710/8 710/10 ; 710/11
16 US 6151640 A 20001121 20 Control I/O module having the ability to interchange bus protocols for 710/11 709/236 ; 709/240
17 US 6133758 A 20001017 13 Selectable self-timed replacement 326/93 326/95
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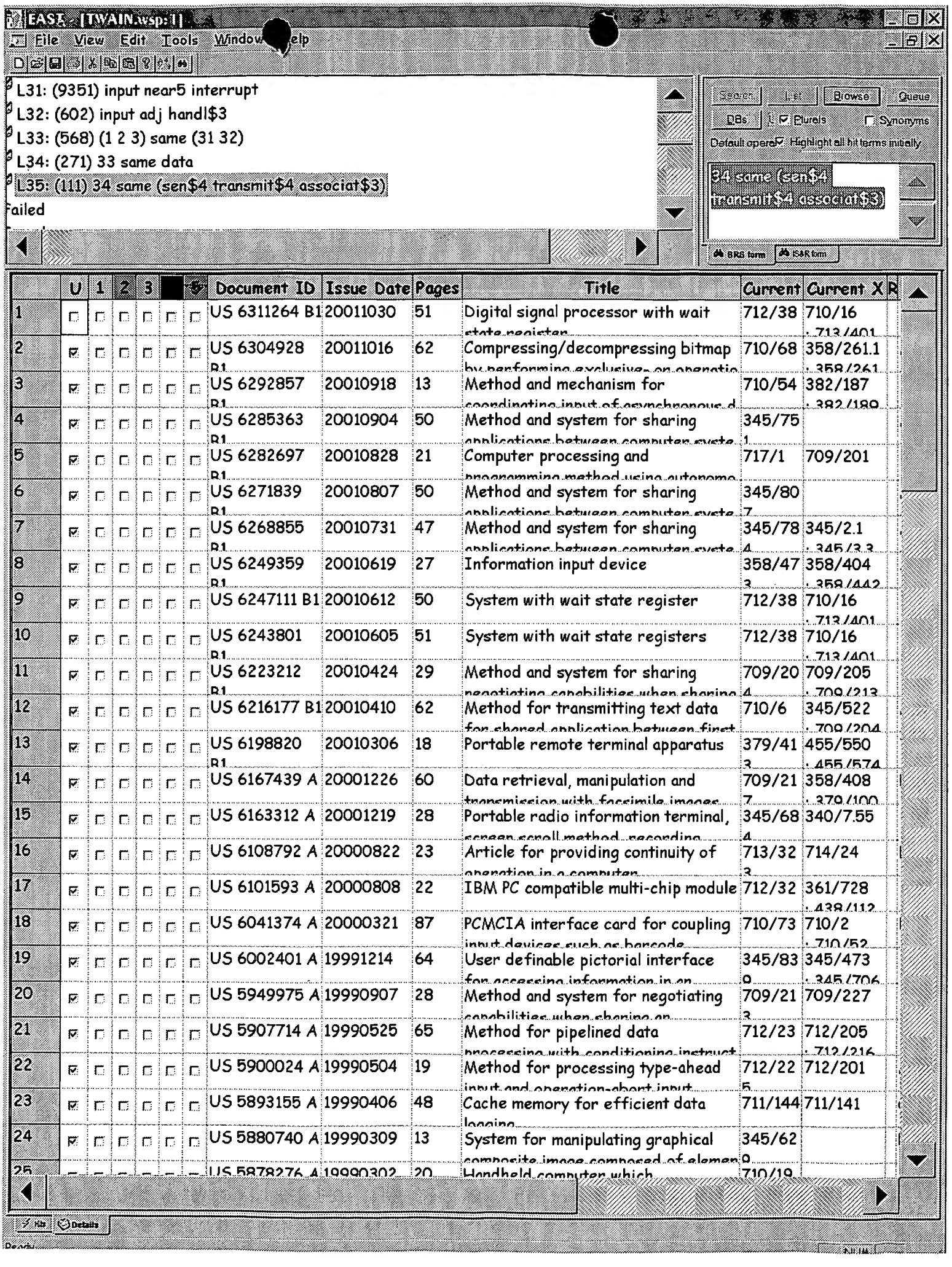
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L34: (271) 33 same data
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U 1 2 3 Document ID Issue Date Pages Title Current Current X R
1 US 6311264 B1 20011030 51 Digital signal processor with wait 712/38 710/16
2 US 6304928 20011016 62 Compressing/decompressing bitmap 710/68 358/261.1
3 US 6292857 20010918 13 Method and mechanism for 710/54 382/187
4 US 6285363 20010904 50 Method and system for sharing 345/75
5 US 6282697 20010828 21 Computer processing and 717/1 709/201
6 US 6271839 20010807 50 Method and system for sharing 345/80
7 US 6268855 20010731 47 Method and system for sharing 345/78 345/2.1
8 US 6249359 20010619 27 Information input device 358/47 358/404
9 US 6247111 B1 20010612 50 System with wait state register 712/38 710/16
10 US 6243801 20010605 51 System with wait state registers 712/38 710/16
11 US 6223212 20010424 29 Method and system for sharing 709/20 709/205
12 US 6216177 B1 20010410 62 Method for transmitting text data 710/6 345/522
13 US 6198820 20010306 18 Portable remote terminal apparatus 379/41 455/550
14 US 6167439 A 20001226 60 Data retrieval, manipulation and 709/21 358/408
15 US 6163312 A 20001219 28 Portable radio information terminal, 345/68 340/7.55
16 US 6108792 A 20000822 23 Article for providing continuity of 713/32 714/24
17 US 6101593 A 20000808 22 IBM PC compatible multi-chip module 712/32 361/728
18 US 6041374 A 20000321 87 PCMCIA interface card for coupling 710/73 710/2
19 US 6002401 A 19991214 64 User definable pictorial interface 345/83 345/473
20 US 5949975 A 19990907 28 Method and system for negotiating 709/21 709/227
21 US 5907714 A 19990525 65 Method for pipelined data 712/23 712/205
22 US 5900024 A 19990504 19 Method for processing type-ahead 712/22 712/201
23 US 5893155 A 19990406 48 Cache memory for efficient data 711/144 711/141
24 US 5880740 A 19990309 13 System for manipulating graphical 345/62
25 US 5878276 A 19990302 20 Handheld computer which 710/19
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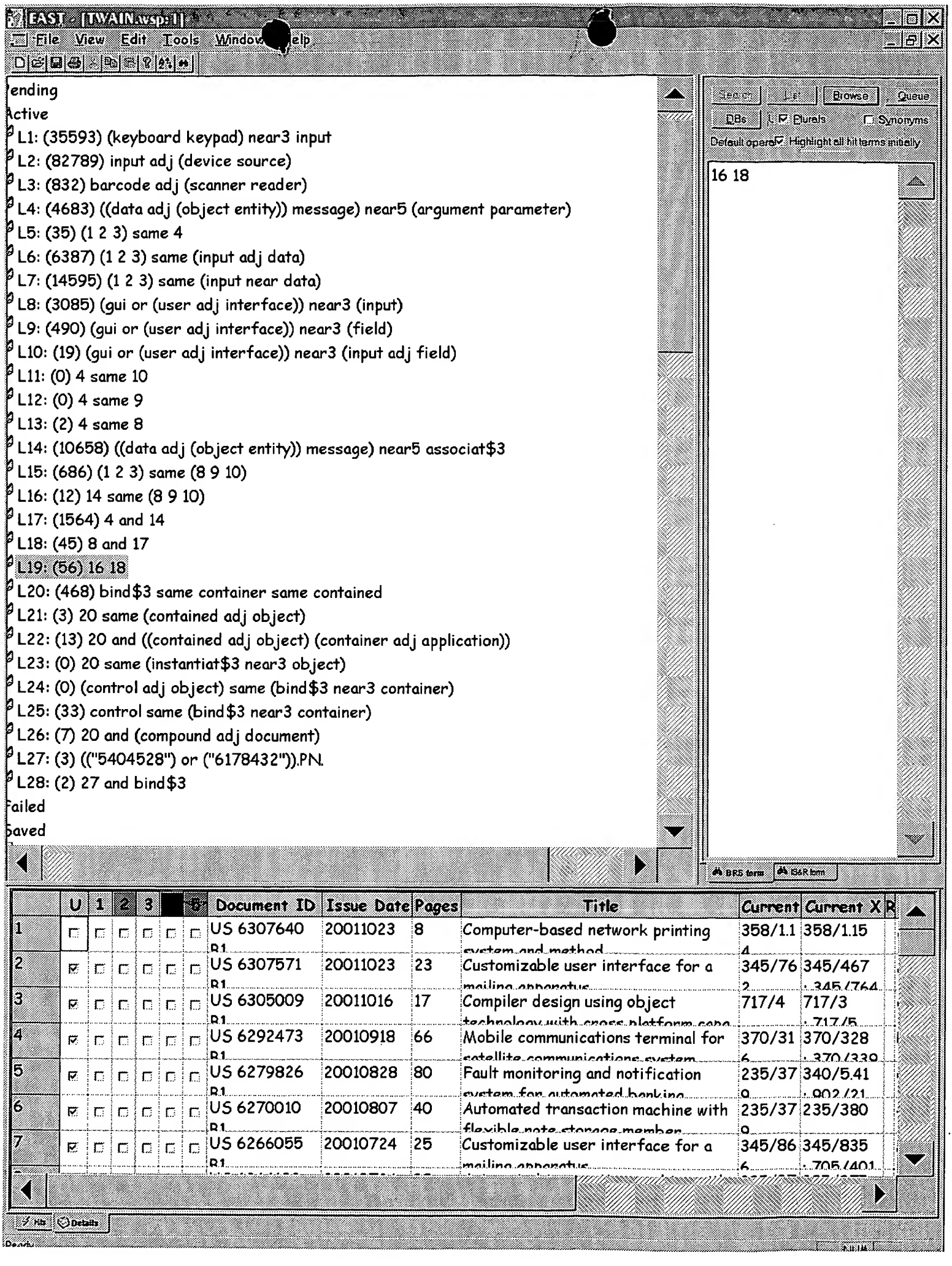

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1	☐	☐	☐	☐	☐	☐	US 6307640 B1	20011023	8	Computer-based network printing system and method	358/1.14	358/1.15
2	☑	☐	☐	☐	☐	☐	US 6307571 B1	20011023	23	Customizable user interface for a mailing apparatus	345/762	345/467 ; 345/764
3	☑	☐	☐	☐	☐	☐	US 6305009 B1	20011016	17	Compiler design using object technology with cross platform capa	717/4	717/3 ; 717/5
4	☑	☐	☐	☐	☐	☐	US 6292473 B1	20010918	66	Mobile communications terminal for satellite communications system	370/316	370/328 ; 370/339
5	☑	☐	☐	☐	☐	☐	US 6279826 B1	20010828	80	Fault monitoring and notification system for automated banking	235/379	340/5.41 ; 902/21
6	☑	☐	☐	☐	☐	☐	US 6270010 B1	20010807	40	Automated transaction machine with flexible note storage member	235/379	235/380
7	☑	☐	☐	☐	☐	☐	US 6266055 B1	20010724	25	Customizable user interface for a mailing apparatus	345/866	345/835 ; 705/401